BRIDGE AND STRUCTURAL ENGINEERING

NEW TITLES

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JOURNALS

Structures and Buildings
ISSN 0965 0911  UK £243  Rest of World £253

Bridge Engineering
ISSN 1478 4629  UK £173  Rest of World £190

Structural Concrete
ISSN 1741 7589  UK £126  Rest of World £139

Advances in Cement Research
ISSN 0965 092X  UK £143  Rest of World £182

Magazine of Concrete Research
ISSN 0965 0911  UK £329  Rest of World £402

www.thomastelford.com
Floods and erosion continue to be the significant causes of bridge damage and failures worldwide. They are also a key consideration in bridge design, construction and maintenance. Growing concern over the security of bridges against the action of water has led to extensive re-evaluation of existing foundations.

This new edition of the Guide to Bridge Hydraulics has been extensively revised and expanded to provide the latest developments on:
- a new chapter on construction, inspection and maintenance
- additional sections on river flow hydraulics, fish passage, floating ice and debris, alluvial fans, and debris torrents
- more in-depth information on hydrology, scour estimation and riprap design
- extensive comments concerning environmental issues
- new text on the evaluation of existing bridges

Presented within this invaluable handbook are sections on basic hydraulic considerations, hydrologic estimates, waterway design and analysis, scour protection and channel control, hydraulic aspects of construction, inspection and maintenance and also special problems such as tidal crossings, waves and debris flow and torrents.

This unique book is an important purchase for all those involved in bridge design, construction and maintenance, such as bridge owners, design offices, bridge consultants and construction equipment suppliers. Covering a wide range of topics, with detailed advice and guidance, in an area of little information on the subject, the Guide to Bridge Hydraulics is the essential publication in its field.

**CONTENTS**
- Basic hydraulic considerations
- Channel types and behaviour relation to bridges
- Basic hydraulic requirements
- Hydraulic design procedures
- Hydrologic estimates
- Statistical frequency analysis
- Runoff modeling
- Empirical methods
- High water levels and stage-discharge relations
- Extreme floods and risk
- Scour protection and channel control
- Scour protection around bridge foundations
- Erosion protection of banks and slopes
- Design of rock riprap
- Cannel control works
- Hydraulic aspects of construction, inspection and maintenance
- Construction
- Inspection
- Maintenance
- Special problems
- Tidal crossings
- Inland basic crossings
- Waves and waves protection
- Physical modelling of bridge problems
- Alluvial fans
- Debris flow and torrents

**Bridge Engineering**

A global perspective
Leonardo Fernández Iregano

Printed in full colour throughout, including 1932 colour illustrations

This book is a comprehensive review of how we create and maintain bridges – one of the most vital yet vulnerable parts of our infrastructure – and how we got where we are today.

Its 800 full colour illustrated pages provide a unique and authoritative reference for practitioners, researchers and students alike on the state-of-the-art of bridge engineering worldwide, from local community footbridges to vast multi-modal crossings between nations.

It also explains the fundamental role of bridges in supporting the flow of people and goods that are vital to sustainable development – and documents mankind’s ever-increasing ingenuity to meet that demand over time.

All types and sizes of bridges are covered – from the earliest stone and timber structures to the modern arch, beam and frame designs in steel and concrete and the spectacular developments in recent years in suspension and cable-stayed crossings.

The book starts by discussing the historic, socioeconomic and environmental significance of bridges, from the earliest times to the present day. The symbolic importance of bridges to communities is acknowledged, as is the need to preserve them as part of our cultural heritage.

A history of bridge design and construction follows, examining in particular the increasing role played by specialist bridge engineers. The materials used in bridge construction are discussed – ranging from timber, stone and cast iron to steel, concrete and the latest advanced lightweight composites.

**CONTENTS**
- Introduction
- Bridges and their historical evolution
- Bridges and their materials
- Bridges, their resistant structures and their building processes
- Arch bridges
- Beam bridges
- Frame bridges
- Cable sustained bridges - suspension and stayed
- Singular bridges
- Index of bridges
- Index of names
- Index of organizations
- References

www.ttbooks.co.uk/bridge-engineering

**Prestressed Concrete Bridges**

Nigel Hewson

Prestressed concrete decks are commonly used for bridges with spans between 25m and 450m and provide economic, durable and aesthetic solutions in most situations where bridges are needed. This book clearly explains the principles behind both the design and construction of prestressed concrete bridge decks, illustrating the interaction between the two. It covers all the different types of deck arrangement and the construction techniques used, ranging from in-situ slabs and precast beams; segmental construction and launched bridges, and cable-stayed structures.

Included throughout the book are many examples of the different types of prestressed concrete decks commonly used, with the design aspects of each discussed along with the general analysis and design process. Detailed descriptions of the prestressing components and systems used are also included.

This book is an essential reference for both the experienced engineer and the graduate who wants to learn about prestressed concrete bridges.
Traffic Loading on Highway Bridges

Peter Dawe, formerly of DFT

From the introduction of steam traction engines in the nineteenth century through to the commercial vehicles and heavy industrial loads of the present day, bridge engineers have had to consider the effects of traffic loads on their structures.

This book provides a detailed examination of all aspects of traffic loading and describes how design and assessment methods have evolved to deal with them. As a former Head of the Bridges Engineering Division of the Department for Transport, Peter Dawe has first hand experience of the requirements of the modern bridge engineer and has provided a comprehensive review of the development of rules for traffic loading.

This book will be of value to students who wish to delve into the background behind the current loading rules, practising engineers who wish to understand the premises upon which the rules are based and researchers who wish to develop the subject further.

Current and Future Trends in Bridge Design Construction and Maintenance: 2

Safety, economy, sustainability and aesthetics
Institution of Civil Engineers, Highways Agency and International Association for Bridge Maintenance and Safety

2004

The Institution of Civil Engineers organised a series of conferences to celebrate the enormous achievements made in the field of bridge engineering in recent years.

This volume of papers, from the second of these conferences, encompasses the state-of-the-art in bridge design, construction, maintenance and safety assessment. It includes papers on major bridge schemes, both completed and under construction, and on innovative approaches used in various parts of the world. It also looks at local and regional projects and bridge-related issues.

Stress Ribbon and Supported Cable Pedestrian Bridges

Professor Jiří Straský

‘Stress-ribbon bridges’ is the term used to describe structures formed by a very slender concrete deck in the shape of a catenary. They can be designed with one or more spans and are characterized by successive and complementary smooth curves. These curves blend into the natural environment and their forms, the most simple and basic of structural solutions, clearly articulate the flow of internal forces which can be erected without undue pressure on the environment.

Stress Ribbon and Cable Supported Pedestrian Bridges looks at how slender concrete deck is used in the design of suspension and cable stayed structures. It looks at their characteristic feature; their rigidity, which is mainly given by the tension stiffness of prestressed concrete deck, so much so that movement caused by pedestrians or wind does not register as discomfort by users. Starting with a brief history the title describes structural types, addresses design criteria, current technology, static and dynamic analysis and discusses the results of the static and dynamic loading tests. Illustrated throughout, Stress Ribbon and cable supported pedestrian bridges provide examples of outstanding structures, which have been recently completed.

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Manual of Bridge Engineering
Edited by M J Ryall, G A R Parke and J E Harding, University of Surrey

“This publication will become the standard reference for engineers involved in bridge research, design and maintenance... Experts in their own particular fields have written the various chapters of this manual. Bringing them together in a single volume has been a major achievement resulting in a manual I can strongly recommend to all bridge engineers.”

Structures and Buildings

The bridge engineering industry creates an ever increasing variation of challenges. This landmark publication brings together all topics that are of interest to bridge engineers around the world in one comprehensive manual. It has established itself as an invaluable reference work.

The manual not only provides a broad overview of the whole subject of bridge engineering, but also focuses on some of the detailed aspects of analysis, design, construction and maintenance.

Manual of bridge engineering is a definitive text for practising civil and structural engineers in consulting firms and government agencies, bridge contractors, research institutes, universities and colleges – in short, all engineers involved in any aspect of the design, construction and repair, maintenance and refurbishment of bridges.

CONTENTS
- The history and aesthetic development of bridges
- Loads and load distribution
- Structural analysis
- Design of reinforced concrete bridges
- Design of prestressed concrete bridges
- Design of steel bridges
- Composite construction
- Design of arch bridges
- Seismic response and design
- Cable stayed bridges
- Suspension bridges
- Moveable bridges
- Modern developments
- Substructures
- Bridge accessories
- Protection
- Bridge management
- Inspection, monitoring and assessment
- Repair, strengthening and replacement
- Index

Cable Stayed Bridges
2nd Edition
René Walther, Bernard Houriet, Walmar Isler, Pierre Molia and Jean-François Klein, Swiss Federal Institute of Technology

1999 Hardbound 232pp
276 x 219 mm 0 7277 2737 7 £70.00

The second edition of this extremely popular book has been updated and enhanced to cover the rapid technological progress in this field. Starting with a brief history, it addresses general design criteria and current technology, as well as static and dynamic analysis. The illustrations provide numerous examples of structures already built and document their critical parameters, including examples of outstanding structures that have recently been completed. The chapter dealing with stay technology has been thoroughly updated to take into account the new, better quality products available from cable suppliers. The results of extensive experimental investigations concerning cable stayed bridges with slender decks, mentioned briefly in the first edition, are also presented.

CONTENTS
- Historical review
- General design
- Parametric study
- Stay technology
- Static design
- Dynamic analysis
- Examples of small and medium-span cable stayed bridges
- Model tests of a cable stayed bridge with slender concrete deck

Steel Bridge Strengthening
A study of assessment and strengthening experience and identification of solutions
Highways Agency and WS Atkins

The Highways Agency has been engaged in assessing and strengthening steel and steel/concrete composite bridges for use by 40 tonne lorries. This report disseminates the knowledge gained, and ingenuity used, during this work and covers measures beyond the initial assessment to avoid or limit strengthening. It identifies strengthening solutions that may have application elsewhere, whether modified or not, and illustrates these by means of 39 case studies. The report also includes the upgrading of bridge parapets and remedial works following bridge bashing and discusses areas such as fatigue, the identification of research requirements, steelwork inspection prior to works, contractual experience and lessons learned for the future. It also includes an extensive list of references to published papers.

CONTENTS
- Introduction
- Inspection and in-situ testing
- Reasons for strengthening
- Methods of avoiding or limiting strengthening
- Factors to be considered when designing strengthening
- Methods of strengthening
- Parapet upgrading
- Bridge bashing
- Fatigue
- Identifying research
- Case histories
- Contractual experience
- Lessons learned for the future
- Conclusions

Integral Bridges
A fundamental approach to the time–temperature loading problem
George L England, Imperial College, Neil C M Tsang, University of Strathclyde and David I Bush, Highways Agency

2000 Paperbound 176pp
297 x 210 mm 0 7277 2845 8 £40.00

Integral bridges have become increasingly popular in the UK. Indeed, the Highways Agency standard now requires, where possible, that all new bridges with a length of less than sixty metres should be of integral form.

This book was commissioned by the Highways Agency to give guidance to bridge designers by addressing the thermally induced soil–structure interaction problem created by environmental changes of temperature and the associated cyclical displacements imposed on the granular backfill to the bridge abutments. It develops a better theoretical understanding of the cyclic performance, in particular the strain ratcheting in the backfill soil when in contact with a ‘stiff’ structure. It also identifies the governing soil parameters and examines their influence in the interaction problem, develops numerical modelling procedures to predict interactive soil behaviour, and identifies and quantifies the controlling features of bridge structures relevant to the interaction problem.
This book reports the findings of a joint study group set up by the French and UK central government highway agencies to liaise on issues concerning post-tensioned concrete bridges and seek solutions for problems where they exist. Throughout the years, these bodies have accumulated a wealth of knowledge, most of which has been unpublished until now. This book makes available for the first time the valuable experiences of the authors, most of who have been personally responsible for formulating and administering the relevant rules and regulations in their respective countries.

The book considers the potential difficulties associated with construction and maintenance, and how these can be identified and combated. It contains extensive historical and technical information with numerous references and bibliographies at the end of most chapters. The book concludes with a look at the future of posttensioned concrete bridges, focusing on the further development of regulatory requirements.

**Management of Highway Structures**
Edited by Parag C Das
1999 Hardbound 272pp
230 x 156 mm 0 7277 2775 3 £47.50

This book begins with an overview of the needs and objectives of bridge management as seen by various highway authorities and operators and introduces recent developments for engineers, accountants and financial decision-makers. Contributions from representatives of bridge authorities as well as international experts address the important political and socio-economic considerations that are relevant to bridge maintenance and give details of the engineering and financial tools and procedures that are currently being developed. The book concludes with details of research projects from different countries relating to various aspects of bridge management.

**Current and Future Trends in Bridge Design, Construction and Maintenance**
Institution of Civil Engineers and Highways Agency

1999 Paperback 650pp
230 x 156 mm 0 7277 2841 5 £85.00

Recent years have seen the construction of revolutionary new bridges, advances in materials and construction techniques and the development of international codes and standards aimed at producing more durable and reliable structures. In addition to further construction, many innovative methods and materials are being used to face the challenges of maintaining and upgrading ageing bridge stock.

This book presents the proceedings of an international conference specially convened to take stock of developments in bridge engineering at the end of the millennium. It includes contributions from leading international experts, supplemented by important papers on major bridge projects and other current issues. Topics include design, construction, assessment methods, reliability analysis and management.

**The Architecture of Bridge Design**
David Bennett, David Bennett Associates
1997 Hardbound 200pp
210 x 258 mm 0 7277 2529 7 £47.50

**Tension Structures**
Form and behaviour
Wanda J Lewis, University of Warwick

The tension structures discussed in this book are predominantly roofing forms created from pre-stressed cable nets, cable trusses, and continuous membranes (fabric structures). A unique feature in their design is "form-finding" – an interactive process of defining the shape of a structure under tension. The book discusses the role of stable minimal surfaces (minimum energy forms occurring in natural objects, such as soap films) in finding optimal shapes of membrane and cable structures. The discussion of form-finding is extended to structural forms whose shape is supposedly known, such as suspension bridge cables.

The book presents numerical modelling of the structural form and behaviour of tension structures, but also addresses certain misconceptions related to their design. It provides unique insights into the most commonly used computational methods, emphasising their main strengths and limitations. Mathematical expositions do not go beyond the level of undergraduate engineering mathematics and, wherever possible, non-mathematical language is used to aid understanding of the fundamental concepts. The intention of the book is to provide a balance between analytical and pictorial aspects of the subject.

**Dynamics of Railway Bridges**
Ladislav Frýba, Institute of Theoretical and Applied Mechanics, Academy of Sciences of the Czech Republic

1996 Hardbound 330pp
230 x 156 mm 0 7277 2044 9 £70.00
Intelligent buildings provide stimulating environments for people to work and live in and operate with systems that provide communications and conveniences for various functions to take place, however society and building owners or tenants demand more than this. Buildings are long-term assets so need to be economical, durable, flexible, adaptable and sustainable. There are many stakeholders involved in the process of building a new intelligent building or updating an old one. There is also a need to recognise the pace of change not only in technology but also in society. Intelligent Buildings must demonstrate whole life value. This means an integrated team approach to design, construction and facilities management is essential if a comprehensive set of performance measures are to be implemented and achieved. Written by a collection of prominent figures, this book brings together a body of the latest knowledge about design, management, technology and sustainability set against a background of developments in the cultural landscapes, which affect those living and working in buildings.

This book will appeal to architects, engineers, practitioners and all stakeholders who are involved in promoting, designing, constructing or operating buildings. This will include building owners and clients as well as facilities managers and those who design and construct buildings. It will also serve as a reference text for students in architecture, building environmental engineering and other courses concerned with the built environment.

CONTENTS:
- Intelligent Buildings
- The Intelligence of Intelligent Buildings
- Building Environment, Architecture and People
- Information Technology, Communications Systems and Artificial Intelligence in Intelligent Buildings
- Design in the Computer Age
- Engineering Intelligence through Nature
- Financial Analysis and Investment Appraisal
- Organisational Strategy
- The Management of Design
- Managing Construction Projects
- Facilities Management
- Case Studies
- Culture of Living and Working
- Sustainable Architecture

Linear Analysis of Skeletal Structures meets the demands of a typical prominent structural engineering educator who aims to:

- teach students how to model, how to use computer packages in real contexts, to validate models, verify results and carry out parameter studies. Hand analysis is now only for very simple problems and for back-of-envelope checks.

The checks referred to are usually statically based and it is therefore presumed that the reader has a firm background in statics. This unique book principally:
- tackles statically indeterminate structures
- replaces traditional hand analysis teaching of indeterminate structures by a workbook format approach based on qualitative and quantitative (computer analysis) studies
- provides comprehensive coverage of the behaviour of skeletal structures – beams, plane trusses arches, plane frames, space trusses, grids and space frames
- uses case studies to provide experience of using computer packages in real contexts; worksheets to develop qualitative understanding; and computer based problems to carry out parameter studies
- emphasises computer modelling and the validation of computer models and solutions.

A workbook approach is used with individual chapters covering fundamentals, beams, plane trusses, arches, plane frames, space trusses, grids, and space frames. Each chapter describes the fundamental behaviour of a particular structural form, which is supplemented by qualitative examples and problems.

The book will make essential reading for all levels of structural, civil, mechanical and aerospace engineers. The book will be an invaluable aid for all students of structural and civil engineering, from the later years of an undergraduate course through to postgraduate work and the early stages of graduate training within the field.

Finite Element Design of Concrete Structures: practical problems and their solutions the author addresses this ‘blind belief’ in computer results by offering a useful critique that ‘important details are overlooked due to the flood of information’ from the output of computer calculations. Indeed, errors in the numerical model may lead in extreme cases to structural failures as the collapse of the so-called Sleipner platform has demonstrated.

Finite Element Design of Concrete Structures: practical problems and their solutions highlights that complex numerical calculations should not be used to compensate for any lack of practical knowledge of the structural behaviour of a structure. An engineer should be able to simplify any real structure into a well defined, known, understandable and designable equivalent structural system. This is an invaluable book for both practical structural engineers and students who are using software for designing concrete structures.

Elements of Spatial Structures: Analysis and Design

M Y H Bangash and T Bangash

This excellent text highlights all aspects of the analysis and design of elements related to spatial structures, using carefully selected examples from existing structures. Analysing the design elements of any full scale structures that have already been constructed makes good economic sense and avoids duplication in respect of research and development and the decision-making process, and provides accurate design criteria for new constructed facilities.

Arch Bridges
C Melbourne, University of Salford

1995 Hardbound 693pp
230 x 156 mm 0 7277 2048 1 £95.00
The text is divided into five sections, each reinforced with case studies and classic and finite-element methods, with loads and materials clearly explained.

- Section I: Loads and material properties of spatial structures
- Section II: Tall building frames, shear walls and lattice/grid roof structure
- Section III: Shell-shaped spatial structures
- Section IV: Cable-suspended, glass and fabric, net and tensegric structures
- Section V: Methods of analysis for supporting structures

A large appendix is included to provide supporting analysis. It includes computer subroutines, seismic and explosion analysis, material cracking and temperature analysis on design-related work, and computer programs for bolted and welded joints, collapse of frames and simple analysis of trusses.

Many examples and case studies are included for practising engineers in an attempt to bring together ideas, forms, material and technical problems as well as a thorough discussion of analysis and structural behaviour.

### Structural Detailing in Concrete

A comparative study of British, European and American codes and practices

2nd Edition

M Y H Bangash, Consulting Engineer

This thoroughly updated edition covers a wide range of topics in order to simplify and reduce the work required to prepare structural drawings and details for reinforced, prestressed, precast and composite concrete. It covers the full scope of structural detailing in the UK, Europe and USA including the fundamentals of drawing, drafting practices, conventional methods of detailing components and a large number of case histories.

Each section has explanatory notes and drawings with up to date information on developmental methods. Each section in this Second Edition has been expanded with codified methods of drafting and detailing of concrete structures based on British, European and American codes of practice, making this edition a fundamental reference for structural engineers practising in different parts of the world.

### Interaction between Structural and Geotechnical Engineers

Edited by Rolf Katzenbach and Jens Turek, Darmstadt University of Technology

This report has been prepared in the framework of the Co-operation in Science and Technology (COST) Action C7 for Soil–Structure Interaction in Urban Civil Engineering. Based on a survey in 13 European countries and with additional input from the COST C7 members, the report focuses on several aspects affecting the interaction between structural and geotechnical engineers. As the theoretical foundation for the interaction between both disciplines is laid during education, the civil engineering education system of several European countries are described and evaluated.

This informative report describes national regulations, such as building codes and laws, which provide the background against which the engineer must operate. Some examples are given of how mutual benefits are achieved by taking soil–structure interaction into account during the design process as well as practical experiences concerning the interaction gained from international construction projects.

### Ground Bearing Concrete Slabs

John Knapton, Consultant

2003

Hardbound

312pp

243 x 170 mm

0 7277 3186 6

£60.00

Ground bearing concrete floors, industrial concrete hard-standings and concrete highway pavements have, in the past, been perceived as a single type of structural element and their construction has taken place independently of each other. This is in spite of their obvious commonality in the areas of design, materials, geotechnical appreciation and construction.

This book has been specifically written to break down the ‘walls’ that have arisen between these three areas and focus on the issues that are common to them all. In one practical, yet comprehensive volume, it integrates the three crucial phases in the development of ground bearing concrete slabs – design, specification and construction.

Numerous case studies are provided which illustrate the design, construction, investigation and specification of each type of ground bearing slab and each case study has been selected to represent those areas likely to be of most relevance to slab designers. For example, a high bay racking warehouse is illustrated and the overlaying of a heavily loaded industrial hardstanding is described. Because concrete is often the preferred construction material for industrial roads where loads may be infrequent but heavy, two such projects are explained.

The book draws from many international authorities, from industrial practice and from the author’s own extensive research and, where it is safe to do so, design short-cuts are presented involving simple charts and tables. Through new design methods, such as the ‘ultimate limit state analytical approach’ and ‘cost-effective steel-free design’, along with such topics as materials, construction, loading and specifications, Ground bearing concrete slabs examines and elucidates on one of the major areas of structural engineering.

For a full list of contents of this book together with some sample material please visit: www.ttbooks.co.uk/ground-bearing-concrete-slabs

### Repair of Concrete Bridges

A TRL state-of-the-art report

G P Mallett, Consulting Engineer

1994

Hardbound

194pp

240 x 189 mm

0 7277 2077 4

£50.00

Repair of Concrete Bridges
Prototype Building Structures
Analysis and design (Volume 1)
M Y H Bangash, Consulting Engineer
1999 Hardbound 944pp
170 x 243 mm  0 7277 2778 8  £175.00

This definitive reference book provides a comprehensive examination of prototype buildings. It contains numerous examples from a wide international perspective. The analysis and designs examined provide valuable information about existing constructional facilities and pave the way for similar structures. Extensive sections are provided for buildings subject to problems caused by wind, earthquakes, explosion, instability and fire. Where new codes are operational, such as Eurocodes, they have been considered in detail.

A comprehensive bibliography and a large appendix providing background analyses and computer subroutines support each volume.

Prototype Bridge Structures
Analysis and design (Volume 2)
M Y H Bangash, Consulting Engineer
1999 Hardbound 1224pp
170 x 243 mm  0 7277 2777 X  £175.00

Following the same format as Prototype Building Structures this extensive reference work also contains examples of the analysis and design of bridges worldwide. These examples provide invaluable guidance for the construction of new bridges. The book deals with the analysis and design of various types of bridges, and covers superstructures, bearings, substructures and foundations. A section on the structural details of short-span bridges and their accessories is included.

The application of codes is discussed in detail. This book has a comprehensive bibliography and appendices providing background analyses and computer subroutines.

You can order the two volume set of Prototype Structures for £300.00 (0 7277 2617 X)

Innovations in Concrete
David Bennett, David Bennett Associates
2002 Hardbound
348pp
230 x 156 mm  0 7277 2624 2  £37.50

This is a state-of-the-art summary of recent developments in construction, design and the innovation in concrete technology. It presents, in an accessible form, a number of building studies where speed of construction, cost savings and early completion were a priority, and highlights the outcome of some highly original and pioneering research on concrete technology.

This book will enable design and construction professionals and students to understand better fast-build technology, increase their awareness of current advances in concrete construction technology and encourage the adoption of some of these techniques on future projects.

Safety of Bridges
Edited by Parag C Das
1997 Hardbound 256pp
230 x 156 mm  0 7277 2591 2  £52.50

Structural Concrete
Finite-element analysis for limit-state design
Michael D Kotsos, University of Athens and Milija N Pavlović, Imperial College, London
1995 Hardbound 512pp
250 x 176 mm  0 7277 2027 9  £85.00

Concrete in Coastal Structures
Edited by R Allen
1998 Hardbound 312pp
276 x 219 mm  0 7277 2610 2  £62.50

In-situ Concrete Industrial Hardstandings
John Knaption, University of Newcastle
1999 Hardbound 264pp
230 x 156 mm  0 7277 2827 X  £37.50

Single Pour Industrial Floor Slabs
John Knaption, University of Newcastle
1999 Hardbound 176pp
230 x 156 mm  0 7277 2734 6  £37.50

This book provides all the information needed by designers and contractors involved in ground bearing industrial floor design. It deals in detail with the design, construction, specification and behaviour of single pour industrial floor slabs. The properties of fibre reinforced concrete are explained as well as the way such materials can be placed quickly and conveniently by laser-guided screening machines.

This book clarifies the manner in which ground conditions govern floor performance and classifies soils in such a way that their influence on floor design and construction can be assessed.

Structural Steel Design to BS5950 Part 1
Frixos Joannides, University College Dublin and Alan Weller, ADW Consultants
2002 Hardbound
280pp
230 x 156 mm  0 7277 3012 6  £40.00

BS5950, the design code for structural steel, has been substantially revised. This book introduces design engineers to the use of BS5950 and gives the necessary information for them to carry out satisfactory design for structures covered by the standard. This includes some guidance on loading, and on where further information may be obtained.

The book discusses various clauses in BS5950 in the light of the basic theory and gives the necessary background information to ensure a good understanding of the document. Worked examples are supplied to enable the reader to follow the code and ensure that all critical design checks are properly understood.

CONTENTS
- Introduction
- Properties of steel
- Limit state safety factors
- Loads
- Behaviour of members
- Members in bending
- Members in compression and tension
- Design of connections
- Design of trusses
- Portal frame design
- Design of multi-storey frames

An Introduction to Cable Roof Structures
2nd Edition
H A Buchholdt, Consulting Engineer
1998 Hardbound 296pp
230 x 156 mm  0 7277 2624 2  £52.50

This book provides all the information needed by designers and contractors involved in cable roof structures. It deals in detail with the design, construction, specification and behaviour of single storey roof cable structures. The properties of cable reinforced concrete are explained as well as the way such materials can be placed quickly and conveniently by laser-guided screening machines.

This book clarifies the manner in which ground conditions govern roof performance and classifies soils in such a way that their influence on roof design and construction can be assessed.
This manual covers many areas of structural steelwork detailing, including fundamentals, drafting practice and conventions, conventional methods of detailing components, full scale constructed facilities and computer-aided practices. A number of codes have also been included for those engineers who wish to carry out in-depth study of practices where jobs are in progress.

Commercial and industrial buildings, bridges and offshore structures are represented in this publication. A necessary purchase for the designer, or detailer, who prepares the working drawings for the fabrication of steelwork, this book serves as both a primer for trainee draftsmen and a reference manual for more experienced engineers and personnel.

CONTENTS
- Introduction to codes
- List of comparative symbols
- Introduction
- Structural steel
- Drafting practice for detailers
- Bolts and bolted joints
- Welding
- Design detailing of major steel components
- Steel buildings – case studies
- Steel bridges – case studies
- Appendix: Section properties
- Bibliography
- British Standards and other standards
- ASTM Standards

Space Structures 5
Edited by Gerard Parke, University of Surrey

These Proceedings are based on the Fifth International Conference on Space Structures, organised by the University of Surrey. Produced as a 2-volume set, they contain original and innovative information on space structures from leading engineers and architects from around the world. The papers cover studies related to the analysis, design and construction of structures including: single, double and multi-layer grids, barrel vaults, domes, towers, pyramidal forms, foldable structures, pneumatic systems, cable networks, membrane structures, retractable systems, space station units and antenna reflectors.

The Proceedings deal with all structural materials, including: steel, concrete, aluminium, timber, fabric, glass, and polymer composites.

Widespan Roof Structures
Edited by Michael Barnes and Michael Dickson, University of Bath

This authoritative book presents current world thinking on the design and construction of large covered spaces. Drawing on contributions from internationally renowned projects, and directly from the designers, architects and engineers responsible, it offers insights into many of the most innovative construction design projects of recent years.

Technologies explored include the advances within stressed membrane roofing, atria and glass structures, with a focus on international developments. The book also addresses the problems of construction associated with these ambitious and vast projects and the attendant environmental issues and concerns that are raised with such high-profile schemes.

Shell Structures in Civil and Mechanical Engineering
Alphose Zingoni, University of Cape Town

Structural Dynamics for Engineers
H A Buchholdt, Consulting Engineer

Manual of Numerical Methods in Concrete
2nd Edition
M Y H Bangash, Consulting Engineer

The completely updated edition presents a unified approach for the available mathematical models for concrete analysis. These are then linked to finite element analysis and to a computer program in which special provision is made for concrete plasticity, cracking and crushing with and without concrete aggregate interlocking. Creep, temperature and shrinkage formulations are included and also geared to various concrete constitutive models. Their influence is taken into consideration in the operational and overloading behaviour of concrete structures.

The book is divided into three sections. Part one reviews existing data on concrete theories, effects of temperature, creep and fatigue. Part two covers numerical modelling of concrete, supported by extensive tables, computer outlines and appendices. Part three is devoted to solving problems on a wide range of concrete structures subject to static and dynamic loads. Case studies have been selected from various areas of civil engineering.
THE ENGINEER’S CONTRIBUTION TO CONTEMPORARY ARCHITECTURE

The Engineer’s Contribution to Contemporary Architecture is a unique collection of books showing how the role of structural engineer has developed and evolved to make a major contribution to modern design and architecture, due entirely to the attitudes and innovations of exceptional engineers.

Owen Williams
David Yeomans, University of Liverpool and David Cottam, Architect

Sir Owen Williams designed buildings as functional structures sheathed with decorative facades. Blurring the roles of engineer and architect, Williams produced a series of innovative reinforced concrete buildings whose aesthetic treatment depended upon an expression of their structures. Although he began his career as an engineer, Williams’s interest in design led him to be considered as an architect in his own right. The book highlights the significant contribution that Williams made to the development of modern architecture through the innovations that he explored in both exposed concrete and glass facades. It discusses the importance of his relationships with others on projects in informing the evolution of his designs. Williams was one of the first to develop aesthetic possibilities of concrete and change its association with cost, functional buildings and industrial structures.

Anthony Hunt
Angus Macdonald, University of Edinburgh

Anthony Hunt and his office Anthony Hunt Associates (AHA) for nearly forty years have produced structural engineering that is celebrated for its visual quality and combined with considerable technical elegance. This book examines the contribution that Tony Hunt has made to the development of British architecture, including his work with four of Britain’s most prominent architects – Norman Foster, Richard Rogers, Michael Hopkins and Nicolas Grimshaw. His interest in the visual aspects of structural design have allowed him to form fruitful partnerships with these and other leading architects and to contribute significantly to the development of the architecture of High Tech Modernism, in which structural expression has played a major visual and architectural role.

Peter Rice
André Brown, Liverpool University

Known for his work on major projects such as the Centre Pompidou, Sydney Opera House and Lloyds Building, Peter Rice received international acclaim as one of the great engineers of the 20th Century. His collaborations with some of the leading architects of our time, including Renzo Piano, Richard Rogers, Frei Otto, I. M. Pei, Norman Foster and Bernard Tschumi, have created memorable landmark structures that are justifiably famous for their style and innovation. Peter Rice adopted a fresh approach for each project, calculated to produce the best possible building, always with respect for the role of the architect. Throughout his career, this method resulted in an inspirational body of innovative work.

The book begins with an examination of key ideas, themes and influences, and then moves on to consider specific projects and typologies. Peter Rice believed it was crucial to change the common perception of the engineer’s role in the design process. A belief that is highly relevant today.

Heinz Isler
John Chilton, University of Nottingham

Best known for his amazing free-form shell structures, Heinz Isler has inspired both architects and engineers with his dazzling creations. His work transcends the definition of mere structural engineering to the extent of becoming structural art. This book considers the unique work, influences and techniques of this exceptional engineer. Isler’s primary medium of expression is the reinforced concrete shell. Rejecting the use of mathematical formulae, he approached the challenges of each new structure by using physical modelling to determine the form and subsequently to investigate its stability. Harmonious, natural and inspiring structures are the result. Isler’s sensitivity for the natural world is expressed in the quiet beauty of the shell forms that he has designed, which merge more easily into the landscape than most modern buildings. He creates structures of high efficiency with the lowest possible environmental impact.

Eladio Dieste
Remo Pedreschi, University of Edinburgh

Eladio Dieste was an innovative engineer, better known in architectural circles for his design of beautiful and apparently improbable soaring structures that appear to defy gravity. His works, however, is based on ‘the application of the laws of physics’ and demonstrates such technical skill that they blur the boundary between architecture and engineering.

Dieste’s use of traditional construction materials such as brickwork shares innovations with others working in more modern materials. It examines the structural forms he developed and analyses selected key projects. The author also includes a chapter describing projects throughout Europe in which Dieste’s ideas and techniques have been adapted and applied. His belief that architecture, form and expression are inseparable from economics, construction and structural efficiency led him to develop a new language of building, that is particularly relevant today.
It is to this group that this book is especially relevant. The methodologies discussed here are concerned with the development of computer-based methods of analysis. This has been reflected in the production of structural mechanics texts that are oriented towards particular numerical methodologies, especially the finite element method. While this approach serves the needs of potential ‘research’ engineers, a concentration on the numerical analysis aspects of structural mechanics is of less relevance to ‘professional’ engineers, who are likely to be concerned with the use and interpretation of numerical analyses, but not in the development of the methodologies.

It is to this group that this book is especially addressed, offering a broad introduction to the principal themes of continuum mechanics and structural dynamics. This edition of the popular book includes a greater focus on worked examples, problems and solutions to engage the reader.

### Advanced Structural Mechanics

**2nd Edition**

David Johnson, Nottingham Trent University

In recent years an increasing emphasis has been placed on numerically based methods of structural analysis. This has been reflected in the production of structural mechanics texts that are oriented towards particular numerical methodologies, especially the finite element method. While this approach serves the needs of potential ‘research’ engineers, a concentration on the numerical analysis aspects of structural mechanics is of less relevance to ‘professional’ engineers, who are likely to be concerned with the use and interpretation of numerical analyses, but not in the development of the methodologies.

It is to this group that this book is especially addressed, offering a broad introduction to the principal themes of continuum mechanics and structural dynamics. This edition of the popular book includes a greater focus on worked examples, problems and solutions to engage the reader.

### Energy Methods in Structural Mechanics

Federico Guarracino, University of Napoli and Alastair Walker, Consulting Engineer

This book provides a basic and clear introduction to the principles underlying finite elements and the computer-based methods of the analysis of structures commonly used in industry.

The analysis principles developed in this book are founded on a few fundamental energy theorems and show how they can be used to provide practical analyses methods. The development presents a uniform yet consistent approach in which the reader is introduced, through variational principles, to the equilibrium equations for beams, plates and the initial buckling of struts. The book emphasises the alternative approach of solving practical problems through the minimisation of energy functionals by means of trial functions for approximate analysis.

### Wind Loading

**A practical guide to BS 6399-2**

Nicholas Cook, Anemos Ltd

2000

Hardbound

322pp

230 x 156 mm

£60.00

All buildings in the UK must now adhere to the recently published wind code BS 6399-2. The introduction of a new code is often traumatic, especially so in this case, as the previous code has been in place for 25 years.

The author’s considerable practical knowledge of wind engineering, together with his involvement in drafting this standard and his experience in conducting workshops on this subject make him the ideal person to convey the strengths and weaknesses of BS 6399-2 in this guide. Following recent amendments to BS 6399-2 (2002) this popular guide has been revised.

Designers’ most common questions and problems are addressed in this guide along with detailed design guidance for estimating wind loads to the new code. Wind Loading sets out clearly why the changes to the code were necessary and in what context the changes will increase or decrease loads, as well as providing clear practical guidance on the provisions of the code and giving assistance in the form of realistic worked examples.

### Acoustics of Long Spaces

**Theory and design practice**

Jian Kang, University of Sheffield

2002

Hardbound

272pp

243 x 170 mm

£62.50

Acoustics is a major concern in many long spaces, such as road or railway tunnels, underground/railway stations, corridors, concourses and urban streets. The specific problems of such irregularly shaped spaces, ranging from noise pollution in streets and tunnels to poor speech intelligibility of public address systems in railway stations, are not dealt with by classic room acoustic theory.

This state-of-the-art exposition presents the fundamentals of acoustic theory and calculation formulae for long spaces as well as giving guidelines for practical design with extensively illustrated work.

Beginning with a description of fundamental concepts, basic theories and modelling techniques relating to general room acoustics, the book moves on to theories and computer models for long spaces. Chapters on long enclosures and urban streets based on parametric studies using the theoretical/computer models, are followed by a description of a series of physical scale-model measurements on the effectiveness of strategic architectural acoustic treatments. Design guidelines are presented with a large number of illustrations. The book concludes with a discussion of speech intelligibility in long enclosures based on a series of articulation tests.

This book will be essential reading for those involved with a large range of disciplines – architecture, urban planning, building services, civil engineering, environmental engineering, transport engineering, mechanical engineering and electrical engineering.

### Vibration of Solids and Structures under Moving Loads

Ladislav Frýba, Research Institute of Transport, Prague

1999

Hardbound

500pp

245 x 170 mm

£72.50

This book analyses the effects of moving loads on elastic and inelastic solids, elements and parts of structures and on elastic media, namely beams, continuous beams, beams on elastic foundations, rigid-plastic beams and thin-walled beams, frames, arches, strings, plates, elastic spaces and half spaces, etc.

It provides theoretical formulations for the problems, and mathematical solutions for all cases and their application to civil, mechanical, transport, naval and aircraft structures. The extensive and up-to-date bibliography gives a worldwide survey.

### Analysis of Beams on Elastic Foundations

Glyn Jones, Birkett Stevens Colman

1997

Hardbound

176pp

230 x 156 mm

£75.00 + £5.25 VAT

(£75.00 + £5.25 VAT)

[no VAT for overseas customers]
Energy and Environmental Issues for the Practising Architect
A guide to help at the initial design stage
Professor Ian Ward, University of Sheffield

Producing an energy efficient and environmentally friendly building can be a daunting task for the every day architect, who may only be commissioned infrequently to produce such a building. This book removes the mystery and complexity from this process by helping the architect understand and put into practice the many issues involved in generating an energy efficient and environmentally friendly design. It is not intended to be a technical manual on energy issues, rather it gives an overview of, and practical advice on how to implement the wide range of topics that must be addressed at the early stages in the design process.

The book is divided into three main sections. The first deals with the background to energy and environmental issues and why it is important to consider them in building design. The second section explains how the various design elements can affect the overall performance of the building. This section is written so that an architect will obtain sufficient understanding of the various areas without the need to have a deep technical understanding of them. The third section takes the architect through the initial design process presenting simplified methods and rules of thumb solutions for assessing the impact of each design issue on the likely performance of the building. Finally several case studies of a range of buildings from the UK, Switzerland, Germany and France are presented with no elevation and with problems of light and shadow.

The book is aimed at anyone who has an interest in the design and procurement of buildings. In particular to the practicing architect and students of architecture along with those studying or practicing in design related fields.

Conceptual Structural Design
Bridging the gap between architects and engineers
Olga Popovic Larsen and Andy Tyas, University of Sheffield

This book aims to ‘bridge the gap’ between engineers’ and architects’ understanding of structural forms. It aims to inspire designers to develop innovative and viable structural forms.

Computer Integrated Planning and Design for Construction
David Langford, University of Strathclyde and Arkady Retik, Glasgow Caledonian University

This book is about the intelligent application of advanced information technology tools (such as CAD and KBES) to design and planning in construction. It considers the current applications of computer tools and presents new ideas for the use of these tools in design and planning processes, concentrating on a preliminary design stage.

The main aim of this text is to demonstrate the implementation of these ideas and uncover the extraordinary opportunities for design improvement as a result. An important feature of this book is its relevance to the work of all participants in the design of buildings – from architects to quantity surveyors. Another useful feature is its use of clear engineering language.

The book is organised into four parts:

Part 1 – Covers the background to information technology in construction with a discussion of a wide range of applications to the technical and informational environments. Issues such as databases and interactive computer graphics, Geographic Information Systems and their uses and artificial intelligence are included.

Part 2 – Refines this to present specific applications of IT for construction projects. In particular computer applications to planning and scheduling, visualisation and concurrent engineering are aired.

Part 3 – Explores the business uses of IT. How computing may be used to support strategic management in construction firms is central to this section.

Part 4 – Provides a number of case studies of how IT has shaped business processes in construction firms. A glossary of key terms is also included.

Cement Chemistry
2nd Edition
H F W Taylor, University of Aberdeen

1997 Hardbound 480pp
230 x 156 mm 0 7277 2592 0 £80.00
ICE GUIDES

ICE DESIGN AND PRACTICE GUIDES

ICE Design and Practice Guides, produced by the Institution of Civil Engineers, provide an introduction to key subjects of interest to engineers. They include discussion of the most important issues, an outline of the main principles involved, checklists, and guidance on authoritative and up-to-date sources of more detailed information. They are suitable for practising civil engineers who have limited experience in a particular area and for more experienced engineers who require an overview of the subject.

Concrete Reinforcement Corrosion

This addition to the ICE’s Design and Practice Guides has been written by renowned expert Peter Pullar-Strecker. Drawing on his broad experience in practice and as a trainer, this Guide tackles concrete reinforcement corrosion at a level that will allow the reader to make quick assessments and plan for the appropriate repair outcomes. It covers such important areas as corrosion of steel in concrete and repair. Further, it takes the reader from the initial investigation and testing of concrete structures, through checklists to detailed structural investigation.

The format follows the popular approach of the series and offers a practical introductory angle to the subject for those with an engineering background. It will be an essential first reference for all levels working in this field.

FRP Composites

Life extension and strengthening of metallic structures

Carbon fibre reinforced composites have been used for many years in the aircraft and shipbuilding industries. They are now being used in a variety of construction applications where their light-weight, high strength and stiffness make them cost-effective.

This is particularly the case in the repair and rehabilitation of existing infrastructure. This title provides design guidance for the use of carbon fibre reinforced composites, based on the results of two major government-funded programmes. It demonstrates that carbon fibre composites can be used with confidence in structural applications. Guidance is given on short and long-term behaviour and how this can be interpreted in a design situation. The case studies, which include projects on the London Underground system, alongside contributions from industry and research groups, make this book a useful resource for structural engineers.

Concrete Industrial Ground Floors

2nd Edition

This guide describes the requirements of industry for high-quality floors and relates these to the engineering solutions adopted as current working practice. The design theory, construction techniques and management of floor-slab construction projects are presented to provide engineers with a broad understanding of the central principles of modern concrete ground floor construction.

Following the success of the 1996 publication, this second edition has been extensively revised to address the influence of the many subsequent developments in materials, specification, components and site applications. Many of these developments raise issues of mutual compatibility. The guide describes these and identifies principles by which many common problems can be avoided.

Structural Appraisal of Iron Framed Textile Mills

This guide begins with a broad overview of mill building structures and their development and then moves on to discuss measures that may be needed to ensure compliance with modern Building Regulations. Evidence is presented to show that the robustness of these old buildings must be assessed carefully and guidance is given on how robustness may be improved.
Design Chains
A handbook for Integrated Collaborative Design
S Austin, A Baldwin, D Root, D Thomson and A Thorpe, Loughborough University, J Hammond and M Murray, AMEC

2001 Paperbound 240pp
297 x 210 mm 0 7277 3039 8 £50.00

Design Chains presents innovative new thinking in supply chain management.

Springing from the work of the Integrated Collaborative Design (ICD) research project, a combined industry and academic initiative between Loughborough University and twelve construction companies, it presents a set of key principles and practices that provide a new approach to design management – the design chain. Design Chains describes how design can be understood, managed and optimised to add value to clients. The practices developed through ICD and described in this book provide a timely response to the need to manage design complexity to help collaborating organisations deliver projects that meet client needs.

The benefits of an ICD approach include:
- creating business level frameworks for organisations to collaborate for mutual benefit on projects
- aiding understanding of design information flows
- helping organisations align their business and project competencies and business cultures
- promoting value adding design solutions on projects
- providing a selection of tools to integrate processes across organisations at the levels of the business and project

Fibre Reinforced Plastics for Reinforced Concrete Structures FRPRCS-5
Edited by Chris Burgeyne, University of Cambridge

2001 Hardbound 112pp 2 vols
230 x 156 mm 0 7277 3029 0 £145.00

Fibre-reinforced plastics are increasingly being used as replacements for steel reinforcement in concrete structures. This book provides up-to-date research results to give engineers confidence in their design methods. Topics considered here include: durability; externally bonded flexural reinforcement; externally bonded shear reinforcement; untensioned or prestressed reinforcement; bond; shear; confinement of concrete in columns or compression zones and seismic behaviour and economics.

Information Technology in Construction Design
Michael Phiri, University of Sheffield

1999 Hardbound 240pp
276 x 219 mm 0 7277 2673 0 £55.00

This book aims to inform architects, engineers and their clients, about new and existing developments in computing which will affect them now and in the future. It looks at the way IT affects businesses and the entire design process for construction projects. Drawing on case studies from architectural and engineering firms, the book assesses IT in action, looking at the way practices strategically organise and resource for IT, at various stages of a project and from project to project.

Sustainable Waste Management and Recycling: Challenges and Opportunities
Proceedings of the International Conference organised by the Concrete and Masonry Research Group and held at Kingston University - London at 14-15 September 2004
Edited by Dr Mukesh Limbachiya and Professor John Roberts, Kingston University

Volume 1 - Glass Waste
September 2004 Hardbound 384pp
234 x 156 mm 0 7277 3284 6 £45.00

Volume 2 - Construction Demolition Waste
September 2004 Hardbound 428pp
234 x 156 mm 0 7277 3285 4 £45.00

Volume 3 - Used/Post-Consumer Tyres
September 2004 Hardbound 358pp
234 x 156 mm 0 7277 3286 2 £40.00

3 Volume Set 0 7277 3287 0 £120.00

With the introduction of waste legislation, in the form of regulations and directives, in many parts of the world a significant move towards sustainable waste management is becoming a legal requirement. Emphasis is now being placed on increasing recycling and promoting more sustainable waste management practices, and greater co-ordination between the public, private and independent sectors, and all concerned with the management of waste and reusable materials. However, sustainable waste management entails complex technological, environmental, social, cultural and economic issues. This, together with technological advances in recycling, means the waste sector is facing enormous challenges in developing suitable waste management and recycling strategies. It is therefore necessary to share and explore existing expertise; to review and discuss the challenges in order to identify opportunities for improving waste management and recycling and promoting sustainable resource use.

The three volumes from part of the Proceedings of the two-day International Conference organised by the Concrete and Masonry Research Group within the School of Engineering at Kingston University, held in September 2004. The Conference deals with issues such as the regulatory framework, government policy, waste management, processing, recovery, the supply network, recycling opportunities, sustainable ways forward and the economics of sustainability.

Recommendations for the Inspection, Maintenance and Management of Car Park Structures

National Steering Committee for the Inspection of Park Structures

2002 Paperbound 112pp
297 x 210 mm 0 7277 3183 1 £35.00

"There are well over 4000 multi-storey car parks in the UK and many have a history of early deterioration, structural defects and safety shortcomings due to poor design and construction and low standards of maintenance and repair."

Adrian Long
Past President, Institution of Civil Engineers

Split into two parts and illustrated in colour throughout, this guide presents practical recommendations that translate into everyday good practice. Part 1 is aimed at the owners and operators of car park structures and details the recommended principles and approaches to good management. In particular, the development and implementation of a Life-care Plan for each car park structure is recommended. Part 2 of the guide is
aimed at the professional engineering adviser and offers more detailed, technical information on the Life-care process for a car park structure, i.e. inspection, appraisal, maintenance, repair, rehabilitation and replacement. The guide also includes four appendices, which contain reference material on design, construction and performance; defects, cracking and deterioration, testing and monitoring; and safety risk and structural appraisal.

This guide will help both owners and operators of multi-storey car parks and their professional advisers to provide, through implementation of Life-care Plans, safe car park structures and cost effective inspection and maintenance with minimum disruption.

The Repair of Historic Timber Structures
David Yeomans
2003 Paperbound 224pp

Intended for a wide audience, including carpenters, architects and structural engineers dealing with the repair and restoration of historic timber structures, this book takes a practical approach. It deals with two types of structure, the oak-framed buildings dating from the Middle Ages (which still survive in some numbers), and the timber elements of masonry buildings from the late seventeenth century. It considers the materials used and the carpentry techniques employed and provides a qualitative account of their structural behaviour.

It then provides a simple analysis of typical structures to show the kinds of stresses that might be encountered. The view taken is that simple methods are more appropriate than the use of modern analytical programmes, given the uncertain member and joint properties. Methods of repair are then discussed and a brief guide is also provided to the survey of historic buildings containing these structures.

Historic Concrete
The background to appraisal
Edited by James Sutherland, Dawn Humm and Mike Chrimes

Historic concrete deals predominantly with concrete in Britain, but makes reference to discoveries and works in other countries where these have influenced practice in Britain. It examines the history of reinforced and prestressed concrete and includes chapters on a range of applications.

This book will be useful for all structural engineers and will also interest architects, surveyors, historians of construction and general readers.

CONTENTS
- Understanding historical concrete
- Innovative uses of concrete by engineers and architects
- Concrete and the structural use of cements in England before 1890
- The era of the proprietary reinforcing systems, the development of reinforced concrete design theory and practice
- Concrete foundations and substructures: a historical review
- The early development of reinforced concrete shells
- Concrete shell roofs 1945–1965
- Prestressing
- The development of concrete bridges in the British Isles prior to 1940
- UK concrete bridges since 1940
- Reinforced and prestressed concrete in maritime structures
- The Concrete Institute 1908–1923
- Tunnels
- Water-retaining structures
- Dams
- Roads and runways
- Military uses
- Appendix
- References

Appraisal and Repair of Timber Structures
Peter Ross, Ove Arup Partnership

This book begins with an extended introduction to timber as a building material: its various forms and properties, its response to environmental conditions, and the Building Regulations relating to its use. It goes on to follow the general sequence of work, starting with the commission, and then dealing with the survey, the investigation and the appraisal. The appraisal, where the most appropriate form of remedial work is selected, is the pivotal point - chapters follow on repair options, report and specification writing, and the additional factors which have to be taken into account when dealing with historic buildings. The book also includes case studies, which discuss timber in relation to other structural materials, as buildings made entirely of timber are very rare.

Appraisal and Repair of Timber Structures will be essential reading for all engineers who deal with timber in structures, and will also be of interest to architects and surveyors who are faced with engineering issues in this area.

CONTENTS
- Introduction
- A history of building form
- The characteristics of timber
- Timber in the building environment
- Building legislation
- The commission
- The general diagnostic sequence
- Initial visual inspection
- The range of possible defects
- Investigative techniques
- The appraisal
- Timber repairs
- Historic buildings
- The report
- The repair contract
- The specification of timber for repair
- Moving timber frames
- Case histories

Properties and Usage of Coal Fly Ash
Lindon Sear, Quality Ash Association

This book draws together a large quantity of research that has been carried out on pulverized fuel ash (PFA) over the past 30 years. Fuel ash and fly ash are produced as waste from burning coal [or waste materials] and have many uses within the construction industry, such as in concrete, land reclamation, treating oil and sewage wastes, bricks and blocks and grouting voids in the ground. In addition to covering the potential uses of PFA it provides an overview of the benefits of use.

CONTENTS
- Use of PFA/fly ash
- Properties
- Use in concrete
- Use as load bearing fill
- Use for road bases and sub-bases
- Use for grouting
- Manufactures aggregates form PFA
- Other types of ashes and uses
- Conclusions
- References
Asbestos and Man-made Mineral Fibres in Buildings

Practical guidance

DfL (now Office of the Deputy Prime Minister)

![Image](filetalltext1)

Over the years since the first edition was published, there has been a great deal of media coverage on the subject of subsidence and a corresponding increase in awareness amongst homeowners.

Unfortunately, recent trends suggest that this increased awareness has encouraged some homeowners to report minor damage that previously would have been dealt with by routine maintenance and decoration. In many cases, the resulting insurance claim leads to expensive and unnecessary remedial work being carried out. At the same time there are still cases where the early signs of significant subsidence are not recognised and the homeowner is incorrectly advised about the need for remedial measures. Both trends ultimately increase the costs for insurers and the inconvenience for policyholders. Making the correct assessment of the cause of the damage at an early stage and keeping the homeowner properly informed are the key to handling subsidence claims successfully.

The purpose of this guide is to explain in simple terms why properties suffer subsidence and heave damage and to offer some independent and objective advice on how the damage should be investigated and how it should be decided whether or not underpinning is required. It is hoped that in the fullness of time, a better understanding of the subject will result in a more rational approach to subsidence and heave damage, which will be reflected in lower insurance premiums and less aggravation for the buyers and sellers of properties that have suffered minor damage.

Guide to Deterioration and Failure of Building Materials

Edited by R O Heckroodt, University of Cape Town

![Image](filetalltext1)

Professionals concerned with the built environment are all too often confronted with cases where building materials have failed prematurely. The information required for the understanding of the causes of such failures, or for the appropriate remedial action is available in a number of texts, however it is generally buried under a mass of other information.

Guide to Deterioration and Failure of Building Materials examines the interactions between environmental conditions, material properties and structural factors and provides practical, concise information on the causes of the deterioration of building materials and offers suggestions and recommendations on how best to deal with them.

There are usually a number of possible repair actions and the task is to find the appropriate
solution, taking into account long-term as well as short-term costs, durability, effectiveness, feasibility and environmental acceptability. Whether it is cracking of concrete members due to overloading, fungal growth on timber or corrosion of metal caused by accumulation of pollutants – all of which are covered in the guide – a detailed analysis of an affected structure is imperative for identifying all the causes that contribute to the deterioration of the material.

The book provides concise synopses and diagnostic tables to aid the analysis of such failures and offers guidelines on appropriate remedial action. It will prove to be an essential resource for all civil and structural engineers, manufacturers of building materials and students studying the built environment.

CONTENTS
- Deterioration of concrete
- Metal failure
- Deterioration of masonry
- Tiling failures
- Deterioration of timber
- Paint failures
- Examples of failure
- Bibliography
- Index

Portland Cement
Composition, production and properties
2nd Edition
G C Bye, retired, formerly Blue Circle Cement
The second edition of this popular book provides an updated introduction to the raw materials and manufacturing processes of Portland cement. The book gives an introductory account of cement composition, manufacture, quality assessment, hydration and the resulting microstructure physical property relationships, and some mechanisms of the chemical degradation of hardened cement paste. This edition has also been enlarged to include a chapter that considers cements related to Portland cement, including its blends with reactive minerals.

Properties and Usage of Advanced Polymer Composites for Structural Applications in Construction
Edited by R A Shenoi and S S J Moy, University of Southampton and L C Holloway, University of Surrey
The use of fibre reinforced polymer (FRP) based composite materials is set to increase to meet demands for improvements in construction processes. The science and technology associated with this subject are advancing at a rapid rate.

This volume of papers from the ACIC 2002 conference covers the application of FRP in concrete structures, metallic structures, concrete cylinders and columns and walls and pipes. It is the direct result of a collaboration between engineers and researchers who convened specifically to exchange ideas and promote the safe and cost-effective use of FRP for structural applications in construction.

Celebrating Concrete: People and Practice
Series editor R K Dhir OBE
These volumes present the proceedings of three symposia organised under the umbrella of Celebrating Concrete: People and Practice, an international meeting organised by the University of Dundee's Concrete Technology Unit.

Role of Cement Science in Sustainable Development
Ravindra K Dhir, Moray D Newlands, Laszlo J Csetenyi
2003 Hardcover 576pp
230 x 156 mm 0 7277 3246 3 £85.00

Role of Concrete in Sustainable Development
Ravindra K Dhir, Moray D Newlands, Kevin A Paine
2003 Hardcover 760pp
230 x 156 mm 0 7277 3247 1 £110.00

Role of Concrete Bridges in Sustainable Development
Ravindra K Dhir, Moray D Newlands, Michael J McCarthy
2003 Hardcover 456pp
230 x 156 mm 0 7277 3248 X £75.00

Celebrating Concrete - 3 Volume Set
0 7277 3245 5 £210.00

Advances in Waste Management
Series editor R K Dhir OBE
These volumes present the proceedings of two symposia held under the umbrella of Advances in waste management, an international meeting organised by the University of Dundee's Concrete Technology Unit.

Sustainable Waste Management
Ravindra K Dhir, Moray D Newlands, Thomas D Dyer
2003 Hardcover 432pp
230 x 156 mm 0 7277 3251 X £75.00

Recycling and Reuse of Waste Materials
Ravindra K Dhir, Moray D Newlands, Judith E Halliday
2003 Hardcover 872pp
230 x 156 mm 0 7277 3252 8 £95.00

Advances in Waste Management - 2 Volume Set
0 7277 3250 1 £145.00
EUROCODES SERIES

DESIGNERS’ GUIDES TO THE EUROCODES SERIES

For more information visit www.ttbooks.co.uk/eurocodes designer guide

Designers’ Guide to EN 1994-1-1 Eurocode 4: Design of Composite Steel and Concrete Structures

General Rules and Rules for Buildings

R P Johnson and D Anderson

June 2004
Hardbound
248pp
297 x 210 mm
0 7277 3151 3
£50.00

EN 1994-1-1, also known as Eurocode 4, is one standard of the Eurocode suite and describes the principles and requirements for safety, serviceability and durability of composite steel and concrete structures.

This Designer’s Guide provides the user with guidance on the interpretation and use of EN 1994-1-1 through worked examples in relation to rules for buildings, structural fire design and for bridges. It explains the relationship with the other Eurocode parts to which it refers and to the relevant British codes. The provision of background information and references also enables the users of Eurocode 4 to understand the origin and objectives of its provision.

This guide is essential reading for:
- civil and structural engineers
- code-drafting committees
- clients
- structural-design students
- public authorities

In fact, everyone who will be affected by the Eurocodes.

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- Annex A [informative]. Stiffness of joint components in building
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Designers’ Guide to EN 1994-1-1 Eurocode 4: Design of steel structures

R Frank, C Bauduin, R Driscoll, M Kavvadas, N Krebs Ovesen, T Orr and B Schuppmann

NEW

September 2004
Hardbound
280pp
297 x 210 mm
0 7277 3154 8
£50.00

After some 25 years in preparation the key parts of EN 1993 Eurocode 3: Design of steel structures have now been finalised. Designers’ Guide to EN 1993-1.1 Eurocode 3: Design of steel structures general rules for buildings covers many forms of steel construction and provides the most comprehensive and up-to-date set of design guidance currently available.

Throughout, this book concentrates on the most commonly encountered aspects of structural steel design, with an emphasis on the situation in buildings. Much of its content is therefore devoted to the provisions of the Part 1.1: General rules and rules for buildings of EN 1993. This is, however, supplemented by material on loading, joints and cold-formed design. For each of the principal aspects covered, the book provides background to the structural behaviour, explanation of the codified treatment including departure from existing practice (BS 5950), and numerous worked examples. This Guide should serve as the primary point of reference for designing steel structures to Eurocode 3.

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- Annex A - Method 1: Interaction factors k, for interaction formula in clause 6.3.3(4)
“Having reached the goal of starting to publish the series of EN Eurocodes, the construction industry needs all possible assistance in applying the codes, and making the necessary transitions from existing national practice. The ‘Designers’ Guides to the Eurocodes’ is a very important step in the process, and should facilitate a fast and effective transition to the full and successful adoption of the world’s leading construction design standards in the UK and wider. I commend them.”

David W Lazenby CBE
Director – British Standards, BSI

Designers’ Guide to EN 1990 Eurocode: Basis of Structural Design
Haig Gulvanessian, Jean-Armand Calgaro and Milan Holicky

2002 Hardbound 200pp 297 x 210 mm 07277 3011 8 £50.00

Annex A - Method 2: interaction factors \( k_i \) for interaction formula in clause 6.3.3(4)
Annex AB - additional design provisions
Annex BB - buckling of components of buildings structures
Design of joints
Cold-formed design
Actions and combinations of actions

Designers’ Guide to EN 1990: Basis of Structural Design is considered the primary document in the Eurocode suite and establishes for the structural Eurocodes the principles and requirements for safety and serviceability of structures. More importantly, EN 1990 must be applied whenever the Eurocodes 1 to 9 are used.

This Designers’ Guide is one of the first to provide detailed information for using EN 1990. It provides technical information on the background to the Eurocode and explains its relationship to Eurocode 1: Actions on Structures and the material Eurocodes (2-6 and 9), Eurocode 7 for geotechnical design and Eurocode 8 for seismic design.

The background to the principles and rules is discussed, emphasising the rules which differ from those in existing codes. Worked examples illustrate the use of new procedures.

This guide will be essential reading for all those affected by the introduction of the Eurocodes - especially:
- civil and structural engineers
- clients
- code-drafting committees
- public authorities

This Guide will prove an invaluable resource for students studying structural design.

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- General
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- Basic variables
- Structural analysis and design assisted by testing
- Verification by the partial factor method
- Annex A1 (normative) - Application for buildings
- Management of structural reliability for construction works
- Design assisted by testing
- Appendix B: The Eurocode Suite
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Sustainable Construction
Use of incinerator ash
Edited by R K Dhir, T D Dyer and K A Paine, University of Dundee

2000 Hardbound 492pp 230 x 156 mm 0 7277 2861 X £60.00

Opportunities for developing sustainable utilisation are becoming increasingly advantageous, and the recovery of maximum value waste materials is a key concern in this process. One of the most effective approaches to value recovery is through the generation of heat and power from waste incineration. Whilst the benefits of incineration are significant, disposal of the ash generated is the main difficulty to justifying this process as a wholly sustainable waste management solution.

This is the Proceedings of the major international workshop that took place at the University of Dundee during March 2000. Papers are included by experts in the field of sustainable construction showing the latest developments in the processing and use of incinerator ash in the construction industry.

Recycling and Reuse of Sewage Sludge
Ravindra K Dhir, Mukesh C Limbachiya and Michael J McCarthy, University of Dundee

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Varying degrees of environmental impact by sewage sludge disposal alternatives, present challenges for waste management practice and policy. Many regulating bodies throughout the world are implementing measures that actively promote environmentally sound and economically viable routes to convert this waste into a valuable resource. These provide opportunities, but at the same time, given the nature of the material and obstacles that may exist, require that responsible and proven practices is followed.

This book presents the proceedings of an International Symposium organised by the Concrete Technology Unit, University of Dundee, which brings together some of the world’s leading experts in the field of sewage sludge recycling.
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Ravindra K Dhir, Mukesh C Limbachiya and Thomas D Dyer, University of Dundee

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This book presents the proceedings of an International Symposium organised by the Concrete Technology Unit, University of Dundee, which brings together some of the world’s leading experts in the field of glass cullet recycling.

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Ravindra K Dhir, Mukesh C Limbachiya and Kevin A Paine, University of Dundee

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Ravindra K Dhir, Mukesh C Limbachiya and Moray D Newlands, University of Dundee

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Inspection and physicochemical analysis
Frank Rendell and Raoul Jauberthie, Institut National de Sciences Appliquées and Mike Grantham, MG Associates Construction Consultancy Ltd

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The reader is then introduced to in situ and preliminary laboratory testing of concrete. The final sections of the book discuss the application of X-ray diffraction and scanning electron microscopy to concrete technology. The content of the book is underpinned by a number of case studies to illustrate the practical problems of concrete inspection and analysis.

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